AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the instant application:

1. (Currently amended) A method for determining the hydraulic flow rate in a pump driven by a synchronous electric motor ~~(12)~~, said motor ~~(12)~~ being of the type comprising a rotor ~~(14)~~, equipped with a permanent magnet, which is rotation-driven by the electromagnetic field generated by a stator ~~(16)~~ equipped with pole pieces ~~(18)~~ with relevant windings, the method comprising the step of:

indirect measuring of said flow rate through the acquiring at least one pump operation variable,

comparing the value of said variable within a predetermined correlation table and determining a corresponding flow rate value, and

determining a corresponding flow rate value

~~characterised in that~~ wherein said step of acquiring said at least one pump operation variable acquires a load angle or delay θ, i.e. a phase shift angle between a network voltage applied to the motor ~~(12)~~ terminals and the counter-electromotive force generated by adding the effects of the stator ~~(16)~~ flux and of the flux induced by the rotor ~~(14)~~ permanent magnet rotation and in that said correlation table links flow rate values and load angle values.

2. (Currently amended) A method for determining the flow rate in a pump according to claim 1, ~~characterised in that it~~ further ~~comprises~~ comprising a calibration step wherein said correlation table is filled by means of experimental tests, theoretical simulations or computer simulations.

3. (Currently amended) A method for determining the flow rate in a pump according to claim 1, ~~characterised in that~~ wherein said step of acquiring said load angle or delay θ occurs continually.

4. (Currently amended) A method for determining the flow rate in a pump according to claim 1, ~~characterised in that it~~ further ~~comprises~~ comprising a step of acquiring a further pump operation variable like a network voltage applied to the terminals of the motor ~~(12)~~.

5. (Currently amended) A method for determining the flow rate in a pump according to claim 1, ~~characterised in that it~~ further ~~comprises~~ comprising a step of acquiring a further pump operation variable like the magnet temperature of the rotor ~~(14)~~.

6. (Currently amended) A method for determining the flow rate in a pump according to claim 1, ~~characterised in that it~~ further ~~comprises~~ comprising a step of compensating said flow rate value when the motor electric supply voltage varies; this compensation being obtained by means of a further predetermined correlation table.

7. (Currently amended) A method for determining the flow rate in a pump according to claim 1, ~~characterised in that it~~ further ~~comprises~~ comprising a step of measuring a temperature of said rotor ~~(14)~~ to compensate the value of said flow rate when the temperature changes and by means of a further predetermined correlation table.

8. (Currently amended) A method for determining the flow rate in a pump according to claim 1, ~~characterised in that it~~ further ~~comprises~~ comprising a step of sensing a signal being proportional to the residual induction ~~(B_R)~~ of the ferromagnetic material of the rotor ~~(14)~~ and dependent on the operative temperature, by means of an analogue Hall sensor ~~(20A)~~.

9. (Currently amended) An electronic device ~~(10)~~ for determining the hydraulic flow rate of a pump driven by a synchronous electric motor ~~(12)~~, said motor ~~(12)~~ being of the type comprising a rotor ~~(14)~~, equipped with a permanent magnet, which is rotation-driven by the electromagnetic field generated by a stator ~~(16)~~ equipped with pole pieces ~~(18)~~ with relevant windings, and comprising:

a processing unit ~~(22)~~ receiving at its input a first signal coming from a magnetic flux sensor ~~(20, 20A)~~ of the rotor ~~(14)~~ and being equipped with or associated to a memory portion storing a correlation table linking hydraulic flow rate values and values of an operation variable of the pump motor ~~characterised in that~~

wherein said pump operation variable is a load angle or delay θ, i.e. a phase shift angle between a network synchronism signal ~~(24)~~ and a counter-electromotive force generated by adding the effects of the stator ~~(16)~~ flux and of the flux induced by the rotor ~~(14)~~ permanent magnet rotation, and ~~in that~~

wherein said processing unit ~~(22)~~ compares said load angle unit said operation variable value stored in said correlation table in order to determine a corresponding hydraulic flow rate value.

10. (Currently amended) An electronic device according to claim 9, ~~characterised in that~~ wherein said sensor ~~(20)~~ is a digital Hall sensor.

11. (Currently amended) An electronic device according to claim 9, ~~characterised in that~~ wherein said sensor ~~(20A)~~ is an analogue Hall sensor.

12. (Currently amended) An electronic device according to claim 9, ~~characterised in that~~ wherein it has a third signal input to receive a signal ~~(26)~~ being proportional to the effective value of the network voltage obtained by means of a voltage regulator ~~(28)~~ to generate a signal (50) being proportional to the hydraulic flow rate completely independent from the electric supply voltage.

13. (Currently amended) An electronic device according to claim 11, ~~characterised in that it comprises~~ further comprising an inner counter ~~(52)~~ to increase the count of the load angle θ at each rising edge of the network clock signal ~~(24)~~.

14. (Currently amended) An electronic device according to claim 11, ~~characterised in that~~

wherein said analogue sensor ~~(20A)~~ detects a signal being proportional to the residual induction ~~(B_R)~~ of the ferromagnetic material of the rotor ~~(14)~~ and dependent on the operative temperature.